was from the embryological standpoint and to the relative nerve supply of the kidney and epididymis.

Dr. Martin Molony: To treat a case of tuberculosis of the testicle, or any part of the urogenital tract, as a separate entity is entirely irrational. Tuberculosis of the testes is but a single manifestation, in the great majority of cases, of disease in the genito-urinary tract at large. Consequently any separation into anatomical divisions is purely artificial. Tuberculosis of the testicle, being the commonest and most easily recognized form of tuberculosis of the genito-urinary system, indicates a tendency to the development of a generalized tuberculosis.

Clinical Report of Case.—A J., age 44 years. Eight years ago while lifting a heavy weight he got an acute, stinging pain in the right anterior renal region shooting down into the scrotum. The testicle swelled up and he consulted a doctor, who said it was a strain. After the swelling subsided a round lump the size of a walnut remained, which subsequently suppurated. It was opened by another physician who said it was an abscess. For six years after he was in good health and had no bladder symptoms. For the last two years he has had bladder symptoms.

Present condition: Large tuberculous nodule in right epididymis, small nodule in left. Tuberculosis in prostate and vesicles. Tuberculosis in bladder. Enlarged, palpable, tender right kidney.

Referring to the path of infection in urogenital tuberculosis: It is now generally held that the route is, in the great majority of cases, from the kidney to the prostate, and from the prostate to the testicle, the prostate being the gateway of entry to the testes.

Contrast two different groups. The first, gonorrheal urethritis and tuberculosis extending down the cord to the epididymis—lower pole—and not through the blood. Both are in the same category. If you agree that one does, you must admit the other.

The second group called metastatic (hematogenous) by some, such as mumps, typhoid, and variola, affecting through the blood stream, always begin in the testes (orchitis) and not in the epididymis.

Blandini, Walker, and others, in their experiments show, that by inoculating the urethra of guinea pigs, rabbits, etc., with bacillus prodigeosus and staphylococcus that the route of ascending infection to the epididymis and kidney is through the lymphatics, and the descending infections by the mucous tracts—the vas deferens, and ureter.

A REPORT OF TWO UNUSUAL CASES OF HERNIA WITH ABSTRACT OF THE LITERATURE.*

By J. J. A. VAN KAATHOVEN, M. D., Los Angeles.

The cases about to be presented to you,. have been selected from records of my service at the Los Angeles County Hospital. The first is one of complete indirect inguinal hernia, on the left side. I bring it before you as it presents many unusual features. The history, in brief, is as follows:

A. M. McC., 67, male, widower, white, cowman by profession. Previous medical and surgical history, negative, except for some slight cardio-renal disturbance, some years ago. No digestive disturbance, no constipation.

History of present condition: Hernia of thirty years duration; he thinks it was caused by a horse falling on him. Patient wore a truss for fifteen years, but hernia has been gradually getting larger. The condition has been irreducible for the past twelve years. He has been unable to work for the past eight years.

Examination practically negative as to blood and urine; slight systolic murmur, at apex.

Patient walks, supporting the tremendous hernia in his hands. The interne described it, "about the size of a six quart bucket." The mass occupies the position of the scrotum, its greatest diameter is approximately 22½ inches,—its smallest, 17¾ inches,—total length from spine of pubis, 13 inches.

Operation: The usual incision, prolonged downward to bottom of scrotum. Aponeurosis of external oblique is somewhat attenuated, though in good condition. Internal ring has been dragged down to external, presenting appearance of a direct hernia, as is true in most cases of extensive and old hernias. Ring admitted three fingers easily, is oval in shape, longest diameter, three inches, shortest, two inches. Sac easily found and opened at the neck. Somewhat adherent to the fascia and surrounding structures, but not as much so as anticipated. Small intestines adherent to sac, also coils mutually attached.

Contents: Small intestines, practically from ligament of Treitz to ilio-cecal valve, cecum, ascending, transverse, and descending colon, as well as sigmoid; appendix easily recognized, not inflamed nor adherent.

The contents could not be returned to the abdomen, without enlarging the ring and putting the patient in exaggerated Trendelenburg posture. Great care was exercised, in returning gut, to avoid reduction "en bloc," to avoid possibility of subsequent strangulation. Sac freed, twisted, and removed, having been transfixed and tied by iodine catgut.

Repair by Andrews' method—the stretching of aponeurosis having made it ideal for the imbrication. Kangaroo tendon was used for the deep sutures, iodine catgut in fascia, Pagenstecher and silk-worm, in the skin.

Notwithstanding the long duration, the internal oblique and conjoined tendon were in good condition, hence the sheath of the rectus was not opened and repair was accomplished with transplantation of cord. Scrotum, which was three-fourths inch in thickness, was resected to the extent of twice the palm of the operator's hand. Rubber drain placed in lower aspect of wound. Usual dressing.

Prompt healing, but for slight skin infection of scrotum, due to patient's lack of care; discharged from hospital after skin infection had healed.

The points of interest in this case are, first and foremost, the tremendous mobility the abdominal organs may assume under pathological conditions. It is indeed, a startling experience, to find the appendix and cecum in a left-sided hernia.

Secondly, the absence of symptoms in this condition. Notwithstanding the fact that all the patient's absorption and elimination were carried on extra abdominally, through an elipse, three inches by two, he did not suffer from indigestion or constipation.

Thirdly, after returning the abdominal contents to its normal habitat, the patient had absolutely no symptoms, even though all the intestines must have occupied tremendously ptosed and otherwise abnormal positions.

Case No. II. Mr. P., male, single, Jewish baker. Family history negative. Past history negative, except patient has never been very strong. Only heavy work he has done is mixing dough, which he says is very hard work.

Present complaint: Four days before admission, while lifting about 100 pounds, patient suddenly experienced a severe pain and stretching sensation, in both inguinal regions. He continued his

* Read at the Forty-fourth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1914.

work, though suffering considerably, but the next day found he could hardly walk, due to pain in both sides. A physician was called who said he suffered from a double rupture and sent him to the hospital.

Examination: Moderate well developed man of medium stature. General condition negative,—urine and blood analyses negative.

The affected regions present swelling about one and one-half inches, inside of the anterior superior spine, just below Poupart's ligament, on both sides,—the right side somewhat larger than the left. Overlying veins are tortuous and enlarged, giving rise to the preliminary diagnosis of varicose veins.

Palpation reveals a tense, cystic, non-inflammatory mass, giving a distinct impulse on coughing and straining.

Provisional diagnosis of femoral hernia is made, though the position is very unusual.

Operation: Through a four and one-half inch incision, starting at the anterior superior spine of the ilium, following and just below Poupart's ligament, dividing the skin and superficial fascia, the sac is revealed underneath the fascia lata. This being divided, the hernial sac is exposed, found flattened out, under the fascia lata, approaching line of vessels. It is easily freed from surrounding structures; it has a wide neck, is short, about the size of a hen's egg. When opened, sac is found to contain some fluid and omentum. The opening through which the hernia escaped, triangular in shape, lying entirely within the lacuna musculorum, easily admits two fingers.

The sac is pulled well out of the abdomen, perforated and tied off with plain catgut. Four chromic catgut sutures, bringing Poupart's ligament and the underlying muscles and the iliac fascia in apposition, obliterates the opening into the abdominal cavity. The fascia and skin are closed with continuous and subcutaneous catgut.

A similar operation was performed on the left side. Here the sac was smaller, not flattened out as much under the fascia lata, hence did not even approach the vessels or nerve, as it did on the right side. Did not contain omentum.

Healing was uneventful, patient getting out of bed, contrary to orders, on the seventh day. Discharged from hospital, in three weeks. The patient was seen in the office two months later, at which time he appeared perfectly well, there being no symptoms of any sort and no impulse upon coughing.

The anatomical and pathological findings of this case were so unusual, that in an effort to throw some light on the condition, I wrote to many men of great surgical experience and also reviewed the literature on extra vascular femoral hernia. Drs. Chas. Mayo and Judd, of Rochester, Edward Martin, Chas. Frazier and John B. Deaver, of the University of Pennsylvania, Dr. Ginsburg, of the same institution, in over 3000 autopsies, the Drs. Gibney, of the Hospital for Crippled and Ruptured, of New York, all assured me they had never met this unusual form of hernia. An abstract of the available literature, here and elsewhere, is remarkable only for its paucity.

The best articles are as follows: Moschcowitz of New York, in a contribution on "Prevascular Femoral Hernia" (Annals of Surgery, June 1912, p. 848), draws attention to the fact that these unusual femoral hernias are frequently associated with injuries of the hip joint, such as dislocations, especially those of congenital and other types requiring frequent manipulations. Narath's series of six is particularly convincing. No such injury or lesions can be found in this case.

E. Wyllys Andrews, in System American Surgery, p. 587: The bowel may exceptionally pass down externally, to sheath of femoral artery. This anomalous form has been called "external femoral hernia" by Bahr (1898) and cases have been reported by McIlvane, Narath, Fabiscius, Cloquet, and Axhausen (last probably Deutsch Zeitschrift für Chir., March and April, 1906). The route of these hernias is between the ileopectineal ligament and femoral artery, at which point the anatomical studies of Leinhart show that a weak place exists.

The very oblique direction of this ligament, from Poupart's ligament backward, leaves a triangular space, wider in front, which is somewhat unsupported in the immediate vicinity of the vessel sheath.

Hesselbach Sr. describes bands which pass from the anterior iliacus sheath to the transversalis fascia and crural arch, forming a sort of guide or septum, leading toward the weak point.

External femoral hernia may occur corresponding to the routes taken by the escaping bowel.

(1) Outside the great vessels.
(2) Alongside the deep epigastric vessels.
(3) Alongside the muscle, behind the vessels.

Maydl also describes a still rarer form which makes its way inside the vessel sheaths.

Bull and Coley, writing in Dennis' System of Surgery, state in re femoral hernia:

In very rare cases, the protrusions may appear directly over the femoral vessels, or even external to the vessels. Such a case has been observed at the Hospital for Ruptured and Crippled, in New York. It occurred in a child three years old and the same form of hernia was found on both sides. The protrusion was the size of a small hen's egg and the opening was slightly external to the femoral artery.

Coley, in Keen's System of Surgery:

Very rarely, the (femoral) hernial sac is found directly over the vessels. This type being designated as "external femoral hernia," examples of which have been described by Narath (Archiv. für Klin. Chir., 1903, Bd. 71). He discovered this form of hernia was often the result of trauma, particularly following attempt at reduction of congenital dislocation of the hip. Still more rarely, the hernia may emerge external to the vessels, or through the lacuna musculorum.

De Gamo (Book on Abdominal Hernia) says:

Macready (Treatise on Ruptures) gives an illustration of a case where three femoral sacs were found upon the same side in one patient. In Macready's case, one protrusion was through Gimbernat's ligament, close to the spine of the pubis, one at its usual place, and the third, just to the outer side of the femoral vessels. Condition not recognized during life.

Page 584—Bergman-Bull System Surgery: Hernia cruralis externa, as described by Hesselbach, is found especially in individuals with a broad

pelvis. It commences in the region of Poupart's ligament and extends downward, in conical manner, the base being quite broad. The tumor is flat, because it lies beneath the fascia and is covered, besides, by the muscular fascia, the fascia lata, and the iliac fascia.

Bahr reports three cases which developed after injury in region of hip.

Narath reports another variety of external hernia which appeared after operation for congenital hip. He reports six such cases in children between sexen years and eleven years, and some data on retro-vascular hernia and cruro-properitoneal hernia.

While many references are made to this abnormal variety of femoral hernia in the literature, I have failed to find an explanation of its occurrence. The etiology remains unexplained. That the defect in the muscular and fascial structure is congenital, seems even more certain in these cases than in the more usual types.

Though the history of three days' duration in this case is misleading, there is no doubt in the writer's mind, that the onset merely marked the descent of an unusual amount of omentum, or indeed, intestines, into the already existing sac.

Study of the anatomy of the part, as described by Hesselbach, Cloquet, and Sir Astly Cooper, of the last century, and the more modern anatomists, demonstrates the following facts:

The iliac fascia is attached to the internal arcuate ligament and covers the entire iliacus and psoas muscle. On the mesial surface, it is continuous with the pelvic fascia. Along the outer two-thirds of Poupart's ligament, it is attached to that structure. The inner third passes behind the femoral vessels, forming the posterior portion of the sheath ot the vessels. In doing so, it divides the space under Poupart's ligament, into a muscular compartment (lacuna musculorum), and a lacuna vasorum.

It is my opinion that the extra-vascular, or Hesselbach hernia, is dependent upon one of two, or both, anatomical defects, viz: a congenital partial lack of the iliopsoas, or a faulty attachment of the iliac fascia, it being fastened to Poupart's ligament only along its outer one-third or one-fourth, rather than the normal two-thirds, causing a weakened loculus, through which the hernia escapes.

THE MENDELIAN LAW AND ITS RELATION TO INHERITED CONDITIONS OF THE EYE.*

By BENJ. F. CHURCH, M. D., Redlands.

We owe largely our knowledge of the workings of inheritance in hybridization to the unpretentious studies of an Austrian monk, Gregor Mendel, who, although a contemporary of Darwin, was probably unknown to him. For eight years, in the middle of the last century, Mendel carried on original experiments by breeding common peas in the privacy of his cloister garden at Brunn.

As Galileo and others who lived beyond their times, Mendel's interpretation of nature's law was not appreciated or understood until after his death.

* Read before the Southern California Medical Society, at Riverside, May 6, 1914.

MENDEL'S LAW.

Mendel's cross-breeding experiments on peas showed certain numerical relations, which is now known as "Mendel's law," briefly formulated as follows: When parents that are unlike with respect to any character are crossed, the progeny of the first generation will apparently be like one of the parents with respect to the character in question. The character that expresses the character upon the offspring in this manner is called the *dominant.* When, however, the hybrid offspring of this first generation are in turn crossed with each other, they will produce a mixed progeny, 25 per cent. of which will be like the dominant grandparent, 25 per cent. like the other grandparent, and 50 per cent. like the parents resembling the dominant grandparent.

Mendel found that when peas of a tall variety were artificially crossed with those of a dwarf variety, all of the resulting offspring were tall like the first parent.

But, when these tall cross-bred offspring were crossed with each other, the resulting progeny were three talls to one dwarf.

On further breeding of the dwarf peas thus derived, they all came true, producing only dwarf peas. On the other hand, the tall ones were of two varieties, one-third "pure" like their tall grandparents, and two-thirds of them "hybrid," giving in turn the proportion of three tall to one dwarf, like their parents. Mendel termed the character, which, in this case tallness, the *dominant;* and the latent character which receded from view, in this instance dwarfness, the *recessive.*

As expressed by Bateson, the essence of the Mendelian principal is *first,* that in a great measure the properties of organisms are due to the presence of distinct detachable elements, separately transmitted in heredity; and *secondly,* that the parent cannot pass on to offspring an element which it does not itself possess. Each germ cell, ovum, or sperm may contain, or be devoid, of any of these elements; and since all ordinary animals and plants arise by the union of two germ cells in fertilization, each resulting individual may obviously receive in fertilization similar from both parents, or from neither, in these cases the offspring is "pure" bred for the presence of the character in question or for its absence. But it may be formed by the union of dissimilar germs, one containing the element, the other devoid of it.

In this case we call the individual cross-bred, or heterozygous in that respect.

CONDITIONS SHOWING DOMINANT DESCENT.

In man, many of the more definite hereditary diseases and malformations follow one or the other of the systems with which Mendelian analysis has familiarized us, dominants or recessives.

Having a dominant Mendelian inheritance, may be mentioned various bony and cartilaginous malformations, several varieties of skin and nervous diseases, pre-senile cataract, strabismus, ectopia lentis, coloboma, distichiasis, night blindness and retinitis pigmentosa. All these conditions descend as dominants.